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26 SEPTEMBER 1991



JPRS Report

Telecommunications

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JPRS-TTP-91-005

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Shijiazhuang-Tangshan DMW Project Accepted

91P60258X Beijing DIANXIN JISHU
[TELECOMMUNICATIONS TECHNOLOGY]
in Chinese No 6, Jun 91 p 48

[Text] Second-phase work on the Shijiazhuang-Tangshan 1920-circuit digital microwave (DMW) project passed the acceptance check conducted a few days ago by the Hebei Province P&T Administration Office. The completion of this new system, put into trial operation on 1 March, will relieve the overcrowded communications conditions in the central and northeast parts of the province. The Shijiazhuang-Tangshan DMW system uses DS4 [140 Mbit/s] technology, which provides high-quality long-distance circuits, clear voice quality, secure transmission, and good resistance to jamming.

Developments in Satellite Communications Reported

Tibet Completes Earth Station

91P60260A Shijiazhuang HEBEI RIBAO in Chinese
6 Jun 91 p 2

[Article by Qiu Sixue [6726 1835 1331]: "Shijiazhuang Institute 54 Completed Construction of Yang Hu Satellite Earth Station in Tibet"]

[Summary] Engineers from [MMEI's] Shijiazhuang Institute 54 completed construction of the Tibet Yang Hu [Lake Yang, 5017 3275] Satellite Earth Station in April this year. The institute had signed a contract in June of last year with Yang Hu Hydropower Station authorities for construction of this earth station, which will be used for long-range communications and weather reporting. Previously, PLA and Military Police maintenance workers at the hydropower station had encountered difficulties with conventional communications due to the high altitude and unusual atmospherics of the Yang Hu plateau.

Ground Station Gifted to Laos

91P60260B Beijing ZHONGGUO DIANZI BAO
[CHINA ELECTRONICS NEWS] in Chinese
21 Jun 91 p 1

[Article by Zhong Binguang [6988 2430 0342] and Liao Xuewen [1675 7185 2429]: "Satellite Ground Station Given as Gift by China to Laos Is Shipped"]

[Summary] On 6 June, two 10-ton trucks bearing a valuable gift presented by the Chinese government, as represented by Premier Li Peng, to Laos set off from Hunan Province's Zhuzhou Radio Plant No. 2 toward Guangzhou's Huangpu Harbor. The gift, a 6-meter automated satellite ground station, was arranged in August of last year, during and after Premier Li's visit to Laos. Li arranged the gift through China Broadcast Television's International Economic & Technological Cooperation Corp., which signed a contract with the Zhuzhou radio plant on 12 April this year.

Beijing To Set Up Nation's First Cable TV

HK2309031991 Hong Kong ZHONGGUO TONGXUN
SHE in Chinese 1500 GMT 22 Sep 91

[Text] Beijing, 22 Sep (ZHONGGUO TONGXUN SHE)—China's first cable television station will soon be set up in Beijing.

The largest characteristic of the television station is that it will perform both functions of broadcasting and receiving. A cable television network will be installed in the whole city. Signals will be broadcast perfectly. There will be coded computerized management for all users while services are provided for users. An appropriate fee will be charged users for the broadcasting of programs. The programs will mainly be entertainment and service programs. This will turn the concept of "family cinema" into something in reality.

Reportedly, the Chinese Ministry of Radio, Cinema, and Television has approved the plan. After the cable television is set up, Beijing will have three television stations, namely, Central Television, Beijing Television, and Cable Television.

Shanghai Cable-TV Usage Reported

OW2109020691 Beijing XINHUA in English
0126 GMT 21 Sep 91

[From "Today's Shanghai News Briefs"]

[Excerpt] Shanghai, September 21 (XINHUA)—[passage omitted] The cable television system in Shanghai now has 173 networks. About 400,000 households, or ten percent of the city's total, have been linked with the system. The number is expected to double within 12 months when the Shanghai cable television station is established.

As with wireless, TV broadcasts, pornographic and horror films are banned on the cable TV system in China.

HONG KONG

BBC Service To Operate 'Throughout Asia'

HK1809021991 Hong Kong SOUTH CHINA
MORNING POST in English 18 Sep 91 p 3

[Article by Kathy Griffin]

[Text] A 24-hour television news service from the BBC World Service will be beamed by satellite into Hong Kong and throughout Asia from November, STAR TV operator Hutch-Vision announced last night.

STAR TV—Satellite Television Asian Region—will carry the English-language BBC World Service Television feed.

Editorial control will rest with the BBC which, in addition to world news bulletins, will feature Asian news, business and weather reporters, and some programmes from its language-teaching arm.

The service will have a "soft" debut on October 14 when STAR TV's Preview channel will begin a two-hour introductory service.

It will be expanded to the full 24-hour feed by November 15.

The co-operation will also enable BBC World Service Radio to use audio channels on the same satellite.

The BBC signal will be sent from London to Hong Kong where Hutch Vision will add advertising before transmitting it to the AsiaSat 1 satellite for broadcast throughout Asia.

STAR TV, which operates through AsiaSat 1, is free to anyone in Hong Kong who has a satellite dish to pick up the signal.

Mr Richard Li, deputy executive chairman of Hutch Vision, said: "We hope that this constructive commitment will become a first step towards making satellite TV services available, on both a free and subscription basis, to all the people of Hong Kong in the language of their choice."

The BBC World Service Television was launched only six months ago in Europe.

SOUTH KOREA

Electronic Exchanges Exported to Vietnam, Europe

SK1909054891 Seoul YONHAP in English 0212 GMT
19 Sep 91

[Text] Seoul, Sept. 19 (YONHAP)—Sales of the time-division exchange [TDX], an electronic telephone

exchange developed with South Korean technology, have spread to six countries and reached 4.1 million circuits, a source at the Communication Ministry said Thursday.

The Soviet Union has contracted to procure 3.75 million circuits over the next five years under a joint venture arrangement.

Poland has contracted to import 113,000 circuits from Korea, and 8,200 circuits are already in operation in Vietnam, the source said.

A joint-venture deal has been made with Romania to produce 60,000 circuits a year for a five-year period until 1995.

TDX, as it is known, allows a separate flow of communication in divided circuits and can handle large volumes of transmissions with speed.

TDX is expected to reach many more East European and African markets as sales activities pick up, according to the source.

VIETNAM

TV Receives Technical Assistance From Japan

BK2209140791 Hanoi Vietnam Television Network
in Vietnamese 1200 GMT 18 Sep 91

[Text] Recently, within the framework of a nonrefundable cultural aid program sponsored by the Japanese Government, the Vietnam Television station received a quantity of technical equipment to set up a special purpose videotape recording studio worth 23 million yen.

Through urgent work, engineers and technicians of the technical section of the Vietnam Television station have completed assembling this modern videotape recording studio after a short period of time.

On 17 September 1991, the Vietnam Television station held an official ceremony to inaugurate this studio, which will help improve the technical quality of television programs.

Attending the ceremony were representatives of the Office of the Council of Ministers, the State Planning Commission, and the Ministry of Foreign Affairs; Japanese Ambassador to Vietnam Hiroyuki Yushita; and a number of Japanese Embassy cadres.

The director general cum editor in chief of the Vietnam Television station thanked the Japanese enterprise for this practical assistance.

ROMANIA

Television Agreement Signed With Turkey

*AU1909203491 Bucharest ROMPRES in English
1914 GMT 18 Sep 91*

[Text] Bucharest ROMPRES 18/9/1991—The cooperation accord between Turkey's national television (TRT)

and the Romanian television was signed on Wednesday afternoon by the heads of the two television stations, Messrs. Kerim Aidin Erdem [spelling as received] and Razvan Theodorescu.

REGIONAL AFFAIRS

Communications Pact Signed With Argentina, Brazil

*PY1909234191 Madrid EFE in Spanish 1942 GMT
19 Sep 91*

[Text] Montevideo, 19 Sep (EFE)—It was reported here today that Argentina, Brazil, and Uruguay have signed a telecommunications agreement whereby the three countries will be interconnected through a fiber-optic cable. This will improve communications and reduce costs.

Representatives of Telintar [expansion unknown], a private Argentine enterprise that handles international communications, Embratel [Brazilian Telecommunications Company] of Brazil, and Antel [National Telecommunications Administration] of Uruguay—both of which are state-run telephone companies—signed the agreement.

Antel director Gabriel Bermudez said that an underwater fiber-optics cable will involve sophisticated technology and will permit high-speed digital communications. It will also allow the three countries to start the world's fiber-optic cable network, providing high-quality services.

The network is scheduled to become operational in 1994. It will cost \$100 million, of which \$15 million will be paid by Uruguay.

Bermudez said that the agreement is "very important" because Uruguay expects to become a supplier of services within the Common Market of the South (Mercosur), whose members are Uruguay, Brazil, Argentina, and Paraguay.

INDIA

Second Remote Sensing Satellite Launched

91AS1556Z Secunderabad DECCAN CHRONICLE
in English 30 Aug 91 pp 1, 9

[Text] Moscow, Aug. 29 (PTI)—India's second remote sensing satellite, IRS-1B, today shot into space on a Soviet rocket notching its eighth success in space in 16 years.

The indigenously designed state-of-the-art remote sensing satellite was successfully launched from Baikonur cosmodrome in the Soviet Union on Soviet rocket "Vostok" at 12.18 p.m. IST [Indian Standard Time].

Immediately after launch, the participating ground stations across the globe tracked the satellite and received telemetry signals indicating healthy functioning of the satellite, its solar panels were deployed soon after, and the satellite swung towards the sun for generation of maximum electrical power from the panels.

The country has thus joined a select band of nations which had established an operational space segment for remote sensing on a continuing basis with the deployment of IRS-1B.

It was the fifth launch of an Indian satellite from the Soviet Union. All of them have been successful like the first Aryabhata, launched on March 19, 1975. The other satellites are Bhaskara-I, Bhaskara-II and IRS-1A.

Built by the ISRO [Indian Space Research Organization] Satellite Centre in Bangalore, it will replace IRS-1A which was launched on March 17, 1988, and is nearing the end of its life. IRS-1A has provided invaluable data for better use of the country's agriculture, land, mineral, marine and water resources.

Scientists said the satellite will orbit over the poles at a height of 904 k.m. taking nearly 103 minutes for each orbit.

IRS-1B weighs about 980 kg. and carries a 700 Watt solar array. Its main payload consists of three cameras to provide visible and infrared imageries of the earth.

Of the 12 launches, only four were failures, including Rohini earth observation satellite launched on August 10, 1979, and Scross-II technology and application satellite launched on July 13, 1988.

The Indian Remote Sensing Satellite IRS-1B resembles an albatross with the solar panels spread out during its voyage around the planet.

The satellite, with the deployed solar panels, measures eight metres from end to end. It hurls through space at seven km. a second, making 14 orbits around the earth a day or 5,110 orbits a year. It covers the sub-continent every 22 days and 307 times a year.

From an altitude of 904 km. from the earth, the satellite's all-seeing-eyes can come up with stunning close-ups that help scientists to identify, for instance, underground water, mineral resources, the crop yield and the extent of damage caused by the floods, super-thermal power stations, dams and mining activities on the environment. The movement of wildlife in various game reserves, the presence of fish catch off the coasts and data for planned growth of urban areas are also provided by the satellite.

The imaging payload system constitutes the "eye" of the satellite. This system is made up of three Linear Imaging Self-scanning Sensors (LISS) which work on the "push-broom concept" of scanning. LISS-I provides a swath of 148 km, while the other two give a composite swath of 145 km.

This satellite has been built at a cost of Rs.[rupees] 15 crores. The launch would cost about Rs. 20 crores. The launch cost covers pre-launch checks, fueling and mating with "Vostok" rocket, and use of the Bearslake ground-station in the Soviet Union.

Scientists said the resolution of the pictures sent by satellite will enable clear separation of areas of the size of a football field, PTI reports from Delhi.

According to ISRO, three years experience with IRS-1A had led to some modifications and improvements in IRS-1B. The modifications resulted in increase of payload by 12 kg.

The USSR which had launched four of India's scientific satellites free of cost stopped free launches in 1988. IRS-1A was the first commercial launch by the Soviet Union and IRS-1B is the second.

According to ISRO, future satellites in the series—IRS-1C and IRS-1D—would be more advanced both in resolution and revisit capability. Preliminary design of these satellites has been completed and their launches are scheduled for 1993 and 1996.

The successful completion of three years by IRS-1A and flawless launch of its successor have demonstrated India's capability for building and operating sophisticated remote sensing system. The United States, France and Japan are the only three other countries that operate similar system.

IRS-1B will become the mainstay of the National Natural Resources Management System (NNRMS) under the Department of Space. NNRMS is a unique system in which conventional data sources are integrated with the spake-based [as published] remotely-sensed data for effective management of India's natural resources.

Improvements in Madras Telephone Network Noted

91WT0183A Madras INDIAN EXPRESS in English
31 Jul 91 p 2

[Text] Madras, 30 July—A regular public switched data network, providing Madras with high speed data communication access to eight other centres, will become operational by December, Madras Telephones Chief General Manager M. Viswanathan said on Tuesday.

Though a small-scale data network had been in operation on an experimental basis, the new network, I-NET, will enable data transmission at speeds up to 64 kilo bits per second, he told newsmen.

At present data communication is on a point to point basis through leased circuits with a maximum speed of 9.6 kilo bits per second. The packet switch at Madras will have 64 ports and allow public access. About half a dozen subscribers in the city have already registered for this service.

Meanwhile, the department plans to provide about 165,000 new connections this year in the city, mainly to ease the situation in Kodambakkam area where about 13,400 people are on the waiting list (the earliest applicant has been waiting from September, 1982).

Though it had geared itself up to provide more new connections and to replace more old equipment around June when 59,700 lines were allotted to Madras Telephones, this was scaled down subsequently to 24,700 lines. About 78,000 persons are on the waiting list in the city.

Of this, about 5,000 lines would go towards the expansion of Haddows Road exchange by February next. Of this 2,000 lines would be used for the transfer of an equal number of lines from Mambalam exchange, which was the first cross-bar exchange to be set up in the country. Three thousand new connections will be provided, General Manager (Development) K.R. Raghunathan explained.

The 5,000 line expansion of the Kodambakkam exchange will be completed by November. The pressure on the existing exchange will also be eased by expanding the Ashok Nagar RLU (mini-exchange) by 800 lines and transferring 500 lines from that exchange to this RLU. Two new RLUs of 800 lines each are also being set up at Koyambedu and Porur to ease pressure on this exchange.

Adyar exchange, which is also under heavy pressure, will have some relief when two new RLUs of 800 lines each come up at Thiruvannamiyur and Perungudi by February 1992.

About 8,000 lines in two old Strowger exchanges—5,000 in Kilpauk and 3,000 in Central—will be replaced. The authorities are hoping to close down the Kilpauk Strowger exchange by March 1992.

Two model exchanges, capable of accommodating 60,000 lines each, are being built at Anna Nagar and Mandaveli. The cable network of these exchanges, including the secondary cable network, will be ducted, and they will have microwave back-up. Optical fibre cables are being used. About 10,000 lines will be initially installed next year at the Rs 7 cr Anna Nagar Exchange which will have a ducting system costing Rs 2.5 cr.

Of the 3,550 local public call offices (PCO) and 641 STD PCOs that are working in the city now, 1,152 PCOs and 641 STD PCOs were set up during 1990-91. By 31 March 1992, 400 more local PCOs and 250 STD PCOs will be added to the network, said General Manager (Exchanges) K.N. Krishnamoorthy.

Madras is the first Metro to achieve the Telecom Commission's target of having one local PCO for every 2,500 population and one STD/ISD PCOs for 10,000 population, he said.

Referring to some of the complaints that the department had received with regard to the functioning of PCOs, he made it clear that no Public PCO (PPCO) was authorised to collect more than the stipulated charge of Rs 1 for a local call.

About 20 PPCO lines had been disconnected following complaints of overcharging, he said. However, STD PCOs were authorised to collect service charges for calls.

Lack of capacity in exchanges was the main constraint in sanctioning new PCOs. In the South area, except for R.K. Nagar (837), Mylapore (7) and Anna Road (83 and 84) none of the other exchanges have spare capacities. Similarly Manali (54), Madhavaram (57) and Kellys (61) have no spare capacities in the North area.

Referring to complaints of over charging by STD PCOs, Mr. Viswanathan said that some of them might be exploiting the public's ignorance of the three-tiered STD tariff and charging the full tariff when only half or quarter tariff should be levied. So they have been directed to prominently display the tariff so that customers could check their bills.

The Department had also discovered that some of these PCOs were serving as "switching centres" for STD calls. The caller would ring up the PCO and seek an STD connection, which would be provided at an extra charge. The local line was linked to the STD line at the PCO with interface equipment. This was prohibited as of now, but the department had written to Delhi to ascertain if the rules could be relaxed, he said.

In 1990-91 the overall revenue from the STD PCOs was about Rs 5 cr. The Department's earnings during that year was Rs 226 cr.

Monitoring of Foreign Television Networks Planned

91WT0182A Calcutta *THE TELEGRAPH* in English
26 Jul 91 p 5

[Text] New Delhi, 25 July—A satellite station will be set up at Jalna in Maharashtra to monitor different foreign television networks, the Union information and broadcasting minister, Mr. Ajit Kumar Panja, told the Rajya Sabha today.

Mr. Panja said the station at Jalna would keep track of the signals received from foreign satellites and check if it conformed to the specifications laid down by the International Telegraph Union (ITU). He said it was not possible to jam signals from foreign satellites.

He said the United Nations had set up a specialised agency to look into the problem of invasion of signals from foreign satellites and unless India monitored them it would not be in a position to report to the Geneva-based UN agency and represent its case.

Several members, including, Mr. Pramod Mahajan (BJP), expressed concern over the proliferation of dish antennae in the country and said more and more people were watching foreign programmes. They wanted to know whether the Doordarshan had any plans to produce better quality programmes to attract viewers.

Mr. Panja said information and broadcasting department officials were building the infrastructure for better production of programmes and he also assured the House that the Prasar Bharati would soon come into being. He said a public corporation would also be floated to compete with the Prasar Bharati. He clarified that it would not be a public sector undertaking like the Damodar Valley Corporation (DVC), but the public could hold shares in the corporation.

Mr. Panja said the government was committed to offer the public corporations broadcasting and telecasting right and allow them to compete with the Prasar Bharati, he, however, did not divulge the details saying that at this stage it was not possible as the modalities for achieving the objective required extensive study before they were finalised.

The deputy minister in the information and broadcasting department, Ms. Girija Vyas, said the government was not ruling out the possibility of bringing amendments to the Prasar Bharati Act. Replying to a question by Mr. P. Upendra (Janata Dal); she said the government was committed to set up the Prasar Bharati within 365 days as promised in the Congress(I) manifesto. She said most of the activities essential to the formal establishment of Prasar Bharati were yet to be completed.

The deputy minister said there was no proposal to televise Parliament proceedings and a decision would be taken by the Lok Sabha speaker and the chairman of the Rajya Sabha.

Space Department Report Details Satellite Program

91WT0181A Bombay *THE TIMES OF INDIA*
in English 15 Aug 91 p 12

[Text] Bombay, 14 August—A total of 105 communication terminals of various sizes and capabilities were a part of the Indian National Satellite System (INSAT) network as of 1 November 1990.

The INSAT telecommunication network provided 4,366 two-way speech circuits or equivalent of 120 routes.

Over 100 additional earth stations, including 50 for the rural telegraphy network pilot project in the north-eastern region were currently under various stages of implementation.

Till 30 September 1990, INSAT-1D provided 958 meteorological data while the figure for INSAT-1B is 30,826.

Giving details of the country's space programme, the annual report of the department of space (1990-91) said that INSAT-1 satellites would be replaced by the indigenously-fabricated second generation INSAT-2 satellites.

Two INSAT-2 test satellites INSAT-2A and INSAT-2B would be launched in 1991-92 and 1992-93, the report states.

Agreements have been signed with "Arianespace" of Europe for the launch of both the satellites.

The capabilities of INSAT-2 have been improved and as a result it was 50 per cent heavier than INSAT-1.

An added feature of INSAT-2 is that it is equipped with a payload for satellite-aided search and rescue missions. "This payload will provide instantaneous emergency alert capability in this part of the world and is an important contribution to the international satellite-aided search and rescue programme," the report states.

The INSAT master control facility at Hassan in Karnataka has been strengthened for the INSAT-2 operations.

Referring to ISRO's Hyderabad-based National Remote Sensing Agency (NRSA), the report states that it has collected about three lakh imageries from the Indian Remote Sensing Satellite-1A which was launched on 17 March 1988.

In the last one year the NRSA data centre has supplied around 14,000 products (73 per cent from IRS-1A, 11 per cent from Landsat, nine per cent from SPOT and seven per cent from the Meteorological Satellite (MET-SAT)) to various agencies which include the Geological Survey of India, the Central Ground Water Board, the Oil and Natural Gas Commission, the Atomic Minerals Division, Department of Environment and the Department of Ocean Development.

About ISRO's launch vehicle technology, the report states that the third development flight of the Augmented Satellite Launch Vehicle (ASLV-D3) was planned for later part of this year or early next year. All the recommendations of the ASLV-D2 expert review panel and the failure analysis committee have been incorporated.

The report states that the first development flight of the Polar Satellite Launch Vehicle (PSLV) was scheduled either late this year or early next year from Sriharikota. The Indian Remote Sensing Satellite-IE is expected to be flown on the first development flight of the PSLV.

About the ISRO range complex, the report says the thrust of its activities were mainly on putting into effect the PSLV launch facilities at Sriharikota. An Indian X-ray astronomy satellite will be put on board the PSLV, according to the report.

Informatics Center Develops Talking Computer

91AS1493A New Delhi PATRIOT in English 22 Jul 91
p 3

[Unattributed article: "Computer With 'Eyes and Ears'"]

[Text] A talking computer developed by the National Informatics Centre (NIC) that can transmit voice and picture via the "Nicnet" work is poised to revolutionise the communication system in the government sector, reports PTI.

Government officials who use the Nicnet will soon be able to hold teleconference without moving out of their offices, according to NIC director general Dr. N. Seshangiri.

There are about 3000 computer terminals in State and Central Government offices hooked on to Nicnet which came to limelight during the recent elections. At present officials use the network only to exchange messages and data.

But a new hardware and software for speech recognition and video signal processing developed at NIC has given teleconferencing capability to Nicnet. This will cut down expenses on official tours.

For example the Home Secretary in Delhi can watch district collectors on television screens and converse with them without the need for telephones.

The Nicnet will be to bring both voice and picture. Thanks to NIC's novel computer.

"What we have developed is a computer with eyes and ears," said Dr. Seshangiri.

The computer listens through a microphone, talks through a loud speaker and "sees" with the help of a video camera connected to it.

It "digitises" the voice and visual signals and transmits them through Nicnet. An identical computer at the receiving end reproduces the words through the loud speaker and flashes the picture on the television screen.

A party of newsmen from Delhi visiting NIC's regional office in Hyderabad was given a demonstration of this unique computer in the final stages of development.

One does not press the keys on the keyboard to give commands to this computer. The commands are given orally to the microphone.

One NIC scientist explained that special systems have been built into the computer to recognise spoken words and digitise booth voice and video signals so that these can be transmitted via Nicnet.

According to NIC regional director Dr. M. V. Koteswara Rao the present limitation with this technology is that the computer can recognise only that 550 spoken words. The vocabulary must be increased to at least 10,000 words for practical applications with Nicnet.

Although NIC has demonstrated picture and speech transmission separately, their synchronised transmission which is necessary for teleconference is yet to be tried.

IRAQ

Telex Contacts To Resume in 'Next 24 Hours'

JN2209131891 Baghdad INA in Arabic 1115 GMT
22 Sep 91

[Text] Baghdad, 22 Sep (INA)—In the next 24 hours, Iraq will resume its telex contacts with the world via 116 new international channels, instead of the current 13 [figures as received].

Dr. Valid Hulu, director of networks and exchange at the State Enterprise for Communications and Post, told INA that the channels break down as follows: Forty Six outgoing channels with America and from there to the rest of the world, 46 incoming channels to Iraq, and 24 incoming and outgoing direct international channels with Jordan.

He said the enterprise opened two general telex centers in Baghdad to serve citizens 12 hours daily.

He also noted that facsimile services were introduced at the post and communications offices throughout Iraq for the purpose of sending messages and cables within the country.

Tallinn, Riga Mobile Phone Nets Expanded

91WT0176A Helsinki *HELSINGIN SANOMAT*
in Finnish 11 Aug 91 p 5

[Text] Finnish and Swedish phone companies have expanded the mobile phone networks to include the capitals of Estonia and Latvia.

The telecommunications companies of Finland and Sweden constructed an NMT-450 system in the Estonian capital, Tallinn, already earlier this year.

Finland's mobile phone operations center was installed in Riga, capital of Latvia, and this made connections between the capitals possible. These connections have been built with cooperation by Estonian and Latvian officials. Now a mobile phone may be used to call not only to Finland, Sweden, Norway, and Denmark but also to Riga and Tallinn.

Initially the greatest benefit of this expansion of communications will be gained by Nordic businessmen and a few Baltic enterprises.

"Estonia and Latvia have had a terrible shortage of telephone lines. There are few places in these countries where mobile phones can be used for international calls," says Jan Kall of Finland's telecommunications.

A phone call to Riga or Tallinn costs over 6 markkas per minute. Balts will have to pay for their calls with foreign currencies.

Radio Rossii Discusses Problems With Reception

LD2209080191 Moscow *Radio Rossii Network*
in Russian 0521 GMT 20 Sep 91

[Excerpt] [passage omitted] This is the question asked by our listeners in numerous phone calls. The fact is, from various parts of our country we are being told that it is impossible to pick up Radio Rossii on various wavelengths. We got in touch with the Communications Ministry, and were told that, indeed, the medium-wave transmissions we use are now undergoing preventive maintenance. Unfortunately, the transmitters used not only by us, but by all radio stations in the Soviet Union, are very, very old, so they need preventive maintenance from time to time. As for other regions such as Moldova, the Ukraine, and Belorussia, we have no information, because the retransmission stations are switched on at the will of the leaders of your republics. It is up to them whether to switch them on or not. As far as the other regions are concerned, for instance Kemerovo, we do not know. I think we will sort out all these questions. I can assure you, so that no one has any worries, that all this has to do with purely technical problems. The technology in our country really is bordering on the fantastic.

REGIONAL AFFAIRS

Delors Urges Japan To Open Up Telecom Market*91AN0495X Amsterdam COMPUTABLE in Dutch
21 Jun 91 p 25*

[Article by Nigel Tutt: "Delors Asks Japan To Open Up Market: Telecommunications Mentioned as Spearhead Sector"]

[Text] Tokyo—European Commission President Jacques Delors has asked the Japanese Government to open up the telecommunications and satellite markets—among others—to European competition.

During his recent visit, Delors discussed the issue with Japanese Prime Minister Toshiki Kaifu. He warned that it would not suffice merely to discuss the accessibility of European products and investments, but that the Japanese attitude, too, would have to change.

Delors' visit follows the publication of the balance of trade figures between Japan and the EC. For some time, the EC trade deficit seemed to be less dramatic, but now Japan is exporting considerably more to the EC than it is importing from the EC. Today, the main issue is technological and industrial dependence, according to Delors. "This is not reflected sufficiently in the current flow of trade."

Delors said it was "strange" that exports to Japan in the area of telecommunications—where European industry is considered to be extremely competitive—have stagnated and said it was primarily the Japanese system which was to blame. He expressed his dissatisfaction with the Japanese distribution system and the standoffishness of Japanese business concerns. "We also have to discuss these kinds of underlying issues which are related to the direct problems of competition."

Standardization Process Behind Schedule*91AN0505X Amsterdam COMPUTERWORLD
in Dutch 26 Jun 91 p 51*

[Article by Paul Ruell: "Lack of Time Forces European Telecommunications Standards Institute To Establish Priorities; Not All Standards Ready for European Unification"]

[Text] Not all standards will be ready when the Single European Market goes into effect. Frede Ask, the Danish deputy director of the European Telecommunications Standards Institute (ETSI), admits that not all EC mandates will be completed in time: "It is clear that the major programs and mandates will be completed in time, but it is equally true that some less important standards have been put on a waiting list."

According to Frede Ask, this delay is a direct consequence of the lack of personnel and resources that his organization has had to cope with for quite some time now: "Expertise in telecommunications is scarce. ETSI

has 12 technical committees and when the number of man-months required exceeds the available manpower, all we can do is establish priorities and make compromises."

ETSI will soon hold its annual technical assembly. The main items on the agenda are: user contributions, intellectual property rights (IPR), and standards for high-definition television (HDTV) and satellite broadcasts. An inquiry into the composition of ETSI's membership revealed that the percentage of users is decreasing every year: While users still represented 11 percent of the total in 1989, this percentage dropped to 9 percent last year.

This lack of enthusiasm is due to the high membership fees and the high traveling expenses involved in attending ETSI's technical meetings in Nice. At the latest meeting, a committee was set up which was to deal exclusively with this problem. The committee wrote a report and developed a 15-point plan which proposes, among other things, to reimburse the users' traveling expenses.

Assistant Manager Frede Ask thinks, however, that for financial reasons this proposal is not realistic: "We are fully aware of the importance of user involvement in ETSI's activities and we are willing to take action to encourage their participation. One action would be a substantial lowering of the membership fees for users. But our financial situation does not allow us to reimburse user traveling expenses. If the European Commission provides a budget for this purpose, we can look into the traveling expenses of the users attending our technical meetings. That is really all we can do."

The main item on the agenda is probably the delicate question of IPR. In addition to the trademarks, these intellectual property rights also cover all patents and copyright stipulations.

ETSI is operating a scheme enabling it to trace patented technologies at an early stage, because patented technologies have inevitably to be covered by new standards. "When developing new standards, one must choose from existing technical solutions. So it is possible that one of our members has a patent on one of those partial solutions; in that case, he must decide for himself what can or cannot be done. If he accepts that his technology is incorporated in the new standard, he must grant a 'fair, reasonable, and nondiscriminating license.' By proceeding this way, subsequent problems can be avoided, hence the importance of having this matter discussed and clearly settled in advance," says Ask.

The new directives will also deal with patent problems which might occur after the public investigation, since ETSI wants to prevent any previously unknown the main item on the agenda at the very moment when Motorola claims the property rights for part of the technology used

in the proposed new standard for digital cellular telephony? By definition, the problem of IPR is an international one and ETSI is known patent holder from instituting legal proceedings against companies which develop products based on the new standard.

Ask denies that ETSI's sudden interest in IPR was provoked by an existing problem; but could it be a coincidence that IPR has been hoping to cooperate smoothly with its American, Japanese, and Korean counterparts. ETSI would rather not burn its fingers to the politically very tricky problem of the future standards for satellite broadcasts and HDTV.

According to work program manager Yves Chauvel, these standards are, in the first place, the responsibility of the European Broadcasting Union (EBU), and only to a lesser extent that of ETSI. "Of course, ETSI is authorized to issue standards, whereas the EBU can only make recommendations, but in our view both HDTV and satellite broadcasts still fall within the EBU's sphere of competence.

"The stakes are very high and passions become overheated. So we think it is much too early to discuss these two standards on a public forum such as ETSI. The members of the EBU should first come to terms with each other. In order to be able to develop a standard, a consensus must first be reached, but so far a consensus is still up in the air. So let us wait until the EBU has sorted out the problem."

European Telecom Operators Create Research Center

91AN0501X Amsterdam COMPUTABLE in Dutch
5 Jul 91 p 2

[Article by Yvonne Ton: "European Operators Join in EURESCOM"]

[Text] Twenty-two public telecommunications network operators from 16 European countries—including the Dutch PTT [Post, Telegraph, Telephone] Telecom—joined in the European Institute for Research and Strategic Studies in Telecommunications (EURESCOM). The organization was set up last March, but cooperation was officially ratified last week in Heidelberg.

The joint initiative's main purpose is to coordinate the research activities of the individual participating concessionaires more effectively. In addition, this cooperation in the area of research should enable Europe to improve its competitive position with respect to the United States and Japan. "We shall have to determine in which areas we can complement each other," declared Prof. Eng. M. Antal, who works with PTT Research and who is a member of EURESCOM's Board of Commissioners. At this moment, Antal thinks there is a lot of overlap in the research activities conducted by the research centers of the 22 telecommunications operators. "Eventually, the creation of EURESCOM could lead to a higher integration of research activities."

The European research institute will mainly focus on such subjects as intelligent networks, broadband integrated services digital networks (ISDN), network management, and the Metran project (involving the development of very-high-speed "electronic highways"). Each of these subject categories encompasses one or several projects for which affiliated operators can sign up individually or collectively. A scientific body which remains to be created will advise on project assignments. In September and October, the first 11 projects will be launched. Depending on the objectives, new projects will be started within the framework of EURESCOM every year. However, during the first two years, absolute priority will be given to infrastructure works.

EURESCOM's headquarters are located in Heidelberg, a town which Antal says was probably selected because of its central location and because of the presence of numerous research centers in the neighboring area. Lisbon and Barcelona were the other possible host cities for the EURESCOM headquarters. The Swede K. Katzeff was appointed EURESCOM director; the rest of the 12 to 15 permanent staff members must be appointed as soon as possible. Last week, EURESCOM's budget for the remaining period of the present year was fixed at 15 million European currency units [ECU]. The precise budget for 1992, which is the first complete calendar year, is not known yet. The participants contribute according to their size, which is determined by the number of telephone connections. Antal cannot figure out exactly how much the Dutch PTT will have to contribute. "Obviously, PTT is only a small operator."

DENMARK

Phone Equipment Sector in Deep Recession

Companies Lay Off Workers

91WT0166A Copenhagen BERLINGSKE TIDENDE
in Danish 6 Aug 91 p 11 1

[Article by Morten Hansted: "Mass Layoffs by Telephone Manufacturers"—first paragraph is BERLINGSKE TIDENDE introduction]

[Text] More than 1,500 pink slips from manufacturers of home and mobile telephones in three years.

The problems in the Danish telephone sector are so great that in only three years, the industry has been forced to lay off more than one-third of the staff.

There are now a little over 2,200 people in the field, and the only consolation is that the drastic cutback wave has obviously hit bottom.

It is the rapid technological development and the competition from foreign plants that has forced the domestic manufacturers to cut it to the quick.

Although a strongly rising market is expected for mobile telephones in the European telenet in connection with

the coming expansion of transmitting possibilities, none of the domestic manufacturers expect the return of the golden times of the mid-eighties.

Among the few bright points in the telephone sector is that GN Store Nord is now in the process of hiring people to construct the new so-called GSM-transmission net for mobile telephones for which Store Nord received the rights earlier in the year.

Up to a total of 250 employees will be hired for the headquarters in Aalborg and the divisions in Aarhus, Odense and Copenhagen during the coming year, 70 of which will be hired this year.

Contraction Since 1989

91WT0166B Copenhagen BERLINGSKE TIDENDE
in Danish 6 Aug 91 II 2

[Article by Morten Hansted: "The Telephone Sector in Sharp Decline"—first paragraph is BERLINGSKE TIDENDE introduction]

[Text] Friday's mass layoffs at the Alcatel-Kirk telephone factory is far from unique. Large portions of the telephone production in the electronic industry is in dire straits.

The Danish telephone sector has been subject to a sharp decline. In only three years, it has handed out more than 1,500 pink slips and with that, the industry has said goodbye to more than every third employee.

Last Friday's mass layoffs at the Alcatel-Kirk telephone factory in Horsens was only one of many examples in an industry that is in full swing of cutting back. This is a serious turnaround from the situation in the mid eighties when the entire Danish telephone sector flourished.

The only one remaining in the home telephone market now is B&O. Here, the chief of the telephone sector, Peter Pasgaard, promises that no cuts will be made in the approximately 90 positions in this division. On the other hand, however, presumably no new people will be hired in the fall which is traditionally the high season for telephones.

"It is not an easy task to produce telephones in Denmark. The warehouses are filled in many places, the expectations of the liberalization of the European telephone market is still far from being implemented," says Pasgaard.

It is only now that B&O has received type approval of its telephones in France after more than two years of difficult attempts, and similar experiences occurred in Germany.

The GN Store Nord computer company GN Telematic felt the consequences in October 1989. All employees in the telephone division were laid off, and 230 employees

are left today in the division which manufactures pay telephones (coin and card phones) under the name GN Communications.

There is no fight about monopolies in the large and strongly rising market for mobile telephones; the blame falls on the increased automation and a price drop in recent years.

"We are forced to become more effective all the time. You only need to look at how the prices for mobile telephones have developed; today, a cheap model can be bought for less than 7,000 kroner, a couple a years ago, the price was twice that," says Martinus Andersen, marketing director for Philips Radio Communications Industry.

His evaluation can be directly seen in the staff management which during the same period has dropped from 650 to 430 employees today at the factory at Amager.

At Dancall, their competitors, which one year ago laid off 370 employees, Jorgen Nielsen, administrating director, says:

"It fine to manufacture telephones in Denmark but it is a question of constant progress. In that area, we are slightly behind at the moment."

Dancall has elected to concentrate increasingly on cooperation with fellow companies in the industry and it has, among other things, established a special development company on a fifty-fifty basis with Cetelco.

The demands for renovations have increased further with the advent of the new so-called GSM-net which, in the process of two years, will make it possible to use mobile telephones in most parts of Europe.

The new transmission net can mean that more and more of the regular home telephone conversations will be carried out to the street and that is, among other things, the reason why B&O is now considering starting the production of mobile telephones—a decision which definitely will be made before next year.

Alcatel Kirk Sold

91WT0166C Copenhagen BERLINGSKE TIDENDE
in Danish 6 Aug 91 p II 2

[Unattributed article: "Alcatel Kirk Has Found a Buyer"]

[Text] The Alcatel Kirk Telephone Company A/S in Horsens has found a buyer for Transducer—one of the two divisions of the company that will be sold, Soren Hoff-Jensen, Alcatel administrative director tells Ritzau [News Agency].

"We have a 'letter of intent' with a buyer," says Hoff-Jensen.

A "letter of intent" is a statement of intention that is used as the foundation in further negotiations between a buyer and a seller.

Transducer, which manufactures components for telephone equipment, has 80 employees. According to the Alcatel Kirk leadership, this is a sound business that can easily make it independently.

GN Store Nord Prospering

91WT0166D Copenhagen BERLINGSKE TIDENDE
in Danish 6 Aug 91 p II 2

[Article by Mort: "Store Nord Hires People for the GSM-Net"]

[Text] While a great many of the Danish telephone companies are presently cutting back, new jobs emerge within the telecommunications sector. GN Store Nord is now in full swing of recruiting personnel for the new GSM-transmission network that will transmit calls to owners of mobile telephones all over Europe as of the spring of 1992. The final choice of a building for the new headquarters has not yet been made but it is decided that it will be located in Aalborg, and that there will also be regional offices in Aarhus, Odense and Copenhagen.

The first round of ads for new staff ended this weekend. The plan is to hire approximately 70 people for the main office this year. At the same time, GN Store Nord is now in the process of finding suppliers of antennas and other equipment for building the transmission network.

In June, GN Store Nord received the concession for a Danish GSM-transmission net that will, along with a corresponding net operated by the public telephone companies, compete for the rising market for transmissions of conversations between mobile telephones.

GN Store Nord's administrative director, Thomas Duer, estimates that the total investment will run from 750 million kroner to 1 billion kroner.

Firm Cuts Wages

91WT0166E Copenhagen BERLINGSKE TIDENDE
in Danish 6 Aug 91 p II 2

[Article by Klavs Snitkjaer: "Wage Cuts Not Enough"]

[Text] The transitional wage cuts that Bruel & Kjaer negotiated with the employees in the spring has now turned out not to be sufficient to carry the business through the crisis. The expenditures are still too great.

According to Kirsten Bruel, board member and main shareholder, the new products require more investments for completion and marketing before there is a prospect of a better profit. Besides, the sharp drop in the previous products has not reversed.

As a result, the electronics company must lay off 450 employees during the next six months. The company will

help the laid off people to find other jobs and older employees will be offered retirement.

"What we are now undertaking will not have economic effect until next year. But with the sales development during the first half of the year, we cannot afford to wait any longer," says Kirsten Kjaer and adds that it is the first time in 21 years that the company has to lay off staff.

According to union steward Knut Langmack, negotiations will now begin with the management about the layoffs.

"In the spring we made an agreement that there would not be any layoffs as we took a cut in our wages. It is obviously worse than it was estimated at first, but I cannot yet say whether the layoffs are a violation of the spring agreement," says Knut Langmack.

The employees were informed about the situation yesterday but they have to wait several more weeks before names can be put on the pink slips.

Bruel & Kjaer's profits during the last five years have been extremely modest. During the same period, the company has invested up to 1 billion kroner in the development of new products.

According to Kirsten Kjaer, 1991 will again be a year of deficit but she expects a surplus next year.

FINLAND

Turkish Mobile Phone Net Expanded

91WT0156E Helsinki HELSINGIN SANOMAT
in Finnish 20 Jul 91 p 5

[Unattributed article: "Telenokia Expands Turkish Mobile Phone Network"]

[Text] Telenokia's mobile phone networks unit has signed a supplementary contract worth about 24 million markkas to expand the Turkish mobile phone network.

At the present time, the Turkish mobile phone network has about 40,000 subscribers, and it covers Ankara and Istanbul and the largest towns of Western Turkey. Now the network is to be expanded to include all the towns of Eastern Turkey. Telenokia began its first equipment deliveries to Turkey in 1986.

Trial for GSM Mobile System Nears End

91WT0156A Helsinki HELSINGIN SANOMAT
in Finnish 2 Jul 91 p 13

[Unattributed article: "Competing GSM Telephone Networks Begin Trial Service in Finland; Approved Telephone Types Will Not Be in Stores Until Next Year"]

[Text] Of the two competing GSM [global system for mobile communications] telephone networks that went

into operation in Finland on Monday, one is operated by the private Radio Line and the other by the state Post and Telecommunications Office (PTL). GSM network trial operations also began simultaneously in Sweden, Denmark, and Germany.

However, general adoption of the digital network will be postponed until after the end of the year because the type of telephone compatible with it has not been approved. In the estimation of the PTL, GSM telephones of an approved type will not be available in stores until next March.

Many manufacturers who will be entering the market during the initial phase will not be exhibiting their commercial GSM phones until mid-October at the Telecom 91 Exposition in Geneva.

The purpose of a GSM network is to open direct mobile phone communications among the countries of Europe. By the end of this year, the network ought to cover the most important communication terminals, capitals, and the communications channels between them.

The private Radio Line received its operating permit last October, after a long period of arm-twisting. The PTL opposed the granting of an operating permit to a private competitor because establishing two networks on the Finnish market is wasteful, according to it.

Radio Line founded its own network to fill the need for competition. It promised to provide Pan-European mobile phone services for half as much as the state telecommunications office charges.

Two-thirds of Radio Line is owned by future users like banks, insurance companies, and commercial and industrial companies. One-third is owned by local telephone companies.

The Radio Line network was opened to a trial run on Monday in Helsinki, Tampere, and Turku. Radio Line has promised to get its network into commercial operation by the last quarter of this year.

Radio Line plans to get its GSM network, dubbed "Europhone," into operation at the end of the year in the capital district, Turku, Tampere, and Lahti, as well as on the highways leading from these cities to Helsinki.

Radio Line has promised to expand its network so that by 1995 as many as 95 percent of all Finns will be living within the area it covers, and, by the year 2000, every Finn will daily be moving about in the area covered by the network. A map of the area covered by Radio Line intended for the public will be published by the end of September, shortly before the Telecom Exposition in Geneva.

Holkeri Rescued Botched Inauguration

The equipment for the Radio Line network was ordered from the Finnish firm Nokia and the German firm Siemens. The Nokia equipment was used during the

inauguration. The Helsinki, Turku, and Tampere relay stations are linked to the GSM central, which is based on the Nokia DX-200 located in Tampere, through the relay station controls.

Bank director Harri Holkeri, a member of the Bank of Finland board of directors, rescued the inauguration. He asserted that the inaugural phone call with Turku City Manager Juhani Leppa had been successfully completed, even though the conversation, which was supposed to be heard by the public assembled on Esplanadi in Helsinki, was not transmitted to the loudspeakers.

To the relief of the Radio Line representatives, who were turning pale, Holkeri asserted that his conversation with City Manager Leppa about Baltic herrings was transmitted just fine by the telephone.

The opening conversation engaged in by Holkeri and Tampere Assistant City Manager Kaarina Suonio also reached the ears of the public over the loudspeakers.

PTL Network Is Being Tested in Helsinki

The GSM trial network opened by the PTL on Monday is operating in Helsinki during the initial phase, through a central station and several relay stations.

By the end of the year, the network will be expanded to Turku and Tampere and, possibly, Oulu and some main highways. The PTL's GSM central was supplied by the Swedish firm L.M. Ericsson and the prototype phones used in the test run by the English firm Orbitel.

The PTL intends to open the GSM network to a limited number of customers this coming fall, even though the GSM telephone type will not be approved before the end of the year. The PTL plans to use an equipment type that has not been approved with its first customers. The PTL will be responsible for replacing them later.

Matti Makkonen, PTL Mobile Telephone Services manager, said that the PTL did not consider it necessary during the initial phase to expand from the capital district to a larger area. According to Makkonen, the PTL network will begin to operate more widely when other European countries get their GSM networks into shape and users can obtain GSM phones.

The PTL objective is to acquire the same areal coverage with its GSM network as it now has with the NMT [Nordic mobile telephone] 900 network. "In a few years, the GSM will be an operational alternative to the NMT-900," Makkonen promised.

According to Makkonen, it does not pay for them to strive for the areal coverage of the NMT-450 with the GSM network.

GSM Network Will Cost a Billion

According to the PTL's Makkonen, it will cost about a billion markkas to build a GSM network that covers the

whole country. Radio Line estimates that its own network will cost about the same amount.

If the PTL had built a network with a similar capacity alone, according to Makkonen, the cost would have risen to about 1.4 billion markkas. According to this kind of arithmetic, the cost to the national economy of having two overlapping networks would be 600 million markkas.

Makkonen estimates that, for the GSM network to operate on a profitable basis, there would have to be roughly 150,000 customers, or about the same number that the NMT-900 now has. Radio Line's estimate of the number of customers needed to guarantee profitable operation is the same. So, in the present competitive situation, 300,000 users of GSM phones, or about the same number of users that there are now in the PTL radio networks, would have to be found in Finland.

At least during the trial run, the PTL seems to think that calls made through it are slightly more expensive than those made through its competitor. According to Makkonen, the PTL charges the NMT-900 rate for GSM calls, 2.16 markkas per minute. Radio Line's trial period rate is 2.09 markkas per minute.

GSM Phones Work With Card

Phones used in the GSM network work with a card that is fed into the telephone equipment. Because the card contains all the information relating to the customer, it will provide access to any GSM phone whatsoever.

For example, a Finnish holder of a GSM card may take his card with him when he travels to London and make his calls with a locally leased phone.

GSM phones operate by digital technology. The equipment transforms sound into digital units and sends speech in the form of bits by radio. The NMT phone sends speech in analog form.

NMT Mobile Phone Net Finds Export Success

91WT0156C Helsinki HELSINGIN SANOMAT
in Finnish 26 Jun 91 p 5

[Unattributed article: "The Post and Telecommunications Office's Nordic Mobile Telephone Network Is Expanding Into Europe"]

[Text] The Post and Telecommunications Office [PTL] maintains and is building two automatic NMT [Nordic mobile telephone] networks. The NMT network is now expanding into Europe because the Post and Telecommunications Office is launching a trial service in the European GSM [global system for mobile communications] mobile phone network in early July. According to the PTL, the GSM represents a new generation of mobile phones that, thanks to the digital technology used in them, will be easy to reach, reliable, disturbance free, and cheaper in the course of time.

New Telecommunications Service Inaugurated

91WT0156D Helsinki HELSINGIN SANOMAT
in Finnish 16 Jul 91 p 15

[Unattributed article: "Telemarketing for Computer Time"]

[Text] Telecommunications Data and Transmission Services is the first in the Nordic countries to adopt a data-based telemarketing program. The program may be used in both calling and answering service operations.

Through the program, a customer may hook up with a data base, use his own format, and send telefaxes directly from the terminal. Customers will not incur any additional cost for the innovation.

Nokia Hurt by Drop in USSR Sales

91WT0156B Helsinki HELSINGIN SANOMAT
in Finnish 21 Jun 91 p B13

[Unattributed article: "Nokia Estimates That Its Profits Are 'Clearly Declining'; Sold-Off Computer Division Begun To Produce Profit; Partial Annual Report"]

[Text] Between January and April, Nokia combine earnings before taxes dropped from 217 million markkas at the start of last year to 24 million.

The result before incidental items was a loss of 40 million markkas.

In addition to consumer electronic equipment, the economic recession has hit the hitherto very successful cable and machine industry and the production of data-communications equipment.

Nokia sales volume declined by 28 percent during the first half of the year, to 5 billion markkas. The largest part of this decline was caused by the fact that the combine sold its computer division to the British firm ICL at the end of May.

When the computer division is omitted from the figures for last year and this year, 8 percent [of the decline] is attributable to the combine's sales volume.

The computer division's earnings have surprisingly risen since the start of last year. Before selling the computer division, Nokia lowered its expenses so much that the division began to produce a profit.

The only Nokia division that produced a loss between January and April was its consumer electronic equipment division.

"Profits Clearly Lower"

In its annual report published in March, Nokia did not dare to predict an improvement in profits this year. General manager Simo Vuorilehto and manager Kalle Isokallio merely wrote that the company has "better chances of beating the competition than before."

In a partial annual report published on Thursday, the company estimated that earnings from business activities this year would "clearly be lower than last year's."

Nokia's sales volume was 1.1 billion markkas last year. According to the company's estimate, its net profit is higher than last year's, thanks to the profits from the sale.

Nokia estimates that profits from consumer electronic equipment and mobile phones will improve this year. The company did not report on its subdivisions' earnings.

The recession Finland and Sweden are experiencing lowered the sales volume of its cable and machine-industry division and its basic industry.

The sales volume of wholesale electrical equipment, for example, rose 6 percent to 412 million markkas, which was obtained last summer, thanks to Finnish Wholesale Electrical Equipment. Company sales conceal the difficulties the wholesale electrical equipment [division] has been having: Using figures that can stand comparison, its sales volume declined by 19 percent.

Cable exports to the Soviet Union came to a halt after the clearing, or barter, system was terminated. The data-communications division, whose sales volume has fallen off by 220 million markkas since the start of last year to the present 570 million, is also suffering from the uncertain situation in the Soviet Union. The bulk of the decline was due to the stagnation of exports to the Soviet Union.

Nokia has decided that it will not supply our Eastern neighbor with goods before the method of payment to be used in trade between Finland and the Soviet Union is settled.

The only Nokia division that showed an increase was the mobile phones division, whose sales volume rose 17 percent, to 864 million markkas.

Expenses Went Down 26 Percent

During the first half of the year, Nokia's sales volume dropped 28 percent to 5.044 billion markkas, but its expenses by only 26 percent, to 4.925 billion. Thus, profits dropped 66 percent, to 119 million markkas.

Profits before taxes after figuring in expenses for financing came to 24 million markkas. Inasmuch as the company noted in calculating its profits that there were 63 million markkas in taxes to be paid for the first half of the year, the result before incidental items was a loss of 40 million.

Under incidental items, Nokia includes in its report for January-April a profit of 246 million markkas obtained from the sale of JA/Mont-Nokia Paper Company shares, among other items. Thus, the profit for the accounting period comes to 274 million markkas.

FRANCE

Nation's Telecommunications Industry Surveyed

Government Policy, Regulations

91WS0467X Maidenhead TELEFACTS in English
Jun 91 pp 3-9

[Unattributed article: "France: The Commercial and Regulatory Environment"]

[Text] Over the past ten years, the French telecommunications industry has distinguished itself in technological advances and, more recently, through innovative approaches to regulatory practice.

Success in the development of the country's telecommunications infrastructure has been all the more remarkable given that in the early 1970s it was one of the least developed in the industrialized world. By the beginning of 1991, 75 percent of all France's subscriber equipment was based on electronic time-division technology and almost 80 percent of the toll network was digitized. The pace of technological change, which has been matched by a concomitant lowering of tariffs (mainly for international messages), rising productivity and quality of service, means that France is able to claim one of the most advanced telecommunications environments in Europe.

The agenda for change in the regulations governing French telecommunications had been set in the early 1980s. It was only towards the end of the decade, however, as the UK, and then Germany, drove further and faster towards a deregulated environment, that France began discussing deregulation.

Until 1990, the public telecommunications network in France was under the control of the Ministry of Posts, Telecommunications, and Space. The Ministry organized, planned and operated services itself, and authorized private companies to supply services in the established manner of traditional PTTs [post, telegraph, and telephone services]. France Telecom, the dominant supplier of services was part of the PTT.

Against this background, the government of Jacques Chirac had instituted a number of privatizations towards the end of the 1980s, most notably of Alcatel NV and Compagnie Generale des Constructions Telephoniques (CGCT), which intensified pressure on government to change its position on regulatory practice.

Although the equipment markets were, by this stage, fully liberalized, proposals for the broader liberalization and privatization of the network were postponed until after the 1988 parliamentary and presidential elections. In 1989, however, the Socialist government of Michel Rocard began to consider the proposals for liberalization propounded in the Prevot report, which Rocard had commissioned to guide debate about the future structure and activities of the PTT.

The Prevot report recommended the continued unity of the posts and telecommunications services under the Ministry of Posts and Telecommunications, while calling for:

- Increased autonomy of management;
- Separation of regulatory and operational activities;
- Clearer financial accountability.

Specific recommendations included:

- A proposal that France Telecom be changed from a civil service department to a public corporation;
- The suggestion that the Direction de la Reglementation Generale, a directorate of the PTT, was not sufficiently separated from the activities of France Telecom;
- A proposal for a general law and pluriannual contracts stating precisely the financial relationship between the state and the posts and telecommunications authorities.

The report argued that postal and telecommunications services should remain public services with their employees continuing to receive the full, though perhaps less formalized, rights of civil servants. Finally, the report suggested that telecommunications services in France continue to be provided through a mix of monopoly and competitive environments, though it remained unclear about where or how such a distinction should be made.

In the wake of the Prevot report, the French government embarked upon a reorganization of the PTT in 1990 and to a large extent acted upon nearly all of its proposals. By the end of that year, on the initiative of Paul Quiles, Minister for Posts, Telecommunications and Space, the French Parliament voted through two laws which had a dramatic impact on the future of telecommunications as a public service. The first law, voted through in July 1990, gave France Telecom the status of an autonomous operator under public corporate law, as the Prevot report recommended. France Telecom was formally separated from the French government and for the first time was made responsible for its own budget.

The second law, voted through in December 1990, laid the groundwork for a regulatory system in the communications sector. The law aimed at establishing an open market and represented a radical step forward for French operators.

One of the most notable features of the new legislation was that a very distinct difference was established between services such as the national telephone and telex service and public payphones, which continued under the aegis of France Telecom, and services such as terminal supply, mobile phone networks, and VANs [value-added networks], which were opened up to competition. The data transmission market, originally intended as a monopoly, was also to be opened up.

Despite this flurry of legislation, Rocard's Socialist government went on to be wary of the private sector; the French government has never demonstrated the same fervor for deregulation that has characterized British development over the past decade. As Jean Berry, spokesman for the Association Francaise des Utilisateurs du Telephone et des Telecommunications (AFFUTT), pointed out as the legislation was passed, the "law goes as far as the political and psychological context of France allows", meaning that a Socialist government would always be reluctant to move towards a totally free market. This caution has meant that competition is limited by certain regulatory controls. Private companies hoping to operate cellular networks, for instance, have to comply with a set of "public service" obligations such as providing national coverage.

To counter the challenges posed by private operators in an increasingly open domestic market, France Telecom has intensified and expanded its international activities. Like many other operators, France Telecom has focused its attentions on developing partnerships with other international carriers with the aim of being able to offer multi-vendor "one-stop shopping arrangements". Europe's first "one-stop shopping" agreement was signed by France and Germany in 1989. Since then, agreements have been signed with the Belgian RTT, Telefonica in Spain, British Telecom International in the UK, PTT Telecom in the Netherlands, and Teleglobe Canada. The company expected to sign agreements in 1991 with Hong Kong, Ireland, Switzerland, US Sprint, IDB, and Worldcom. France Telecom is also a signatory of the European agreement on "one-stop shopping," which will provide a formal groundwork for US leased line customers to access the entire European market through a single point of contact.

France Telecom's international strategy continued apace in 1990. In the course of that year, a protocol of agreement was signed for the continuation of studies concerning the SEA-ME-WE 2 optical submarine cable linking Western Europe, the Middle East, the Indian subcontinent and South East Asia. This project is scheduled for completion in 1994.

Another protocol agreement was signed for the construction of the SAT 2 submarine fiber optic cable which will link South Africa to the Island of Madeira and the Canaries. It will then be connected to the EURAFRICA cable (linking France, Portugal, Morocco, and the Island of Madeira), to go into service by mid-1992. In July 1990, France Telecom became a member of the "Trans-Soviet-Line Development" consortium responsible for planning the Trans-Soviet optical cable project linking Western Europe, the Soviet Union, and Japan. In December 1990, the Eastern Mediterranean Optical Network EMOS-1, linking Sicily with Greece, Turkey and Israel was put into service.

France Telecom has also carried through a policy of making acquisitions abroad. In November 1990, the company (through its subsidiary France Cables et Radio)

purchased 32.5 percent of Telecom Argentina, the new telephone operating company in the north of Argentina which was established in the wake of the acrimonious break up of the Argentine state monopoly ENTel. In December 1990, the company chose a consortium made up of France Telecom, Southwestern Bell, and Grupo Carso to take control of Telmex, the national communications carrier.

The PTT Today

At the end of 1990, France Telecom reported a turnover of 103,000 million French Francs (FF), an improvement of 8 percent on 1989's figure. The company accounted for this increase by pointing to the success of rapidly growing products such as fax, telematics, the telephone kiosk service, and toll-free numbers. At the same time, France Telecom reported a substantial growth in the use of data transmission services (up 14 percent) and mobile telephony (up 30 percent), both of which also contributed to the company's increased turnover.

France Telecom is structured at four main levels.

- The highest level, Central Administration, is headed by the Directorate General for Telecommunications. It defines and organizes overall policy.
- The second level consists of seven national directorates, three special service divisions, and 22 regional directorates, with each regional directorate implementing national objectives within its own area, and research centers (CNET, CCETT, SEPT).
- The third level has 57 operational directorates, five of which are responsible for the national networks within their areas; four for overseas territories; and 48 for management, operation, and maintenance of network services and customer relations. This level also includes two national schools and one institute, all of which operate as telecommunications education centers.
- The fourth level includes switching centers, line construction units, and engineering and commercial agencies.

Included in France Telecom's top level of organization is the Compagnie Generale des Communications (Cogecom), the holding company for all France Telecom's subsidiaries responsible for the development and operation of specialized communications services apart from mobile communications. In the course of 1990, Cogecom reinforced its financial structure within the France Telecom Group. Cogecom's capital was increased to FF 2,400 million in order to support the development of its subsidiaries, particularly abroad.

The following subsidiaries fall under Cogecom's umbrella:

- Telesystemes supplies data communications equipment and services in France. In the course of 1990, this division set up an Italian affiliate, Telesystemes Datamont, and acquired shares in the German firm IOP. In 1990, this division reported a turnover of FF 1,600 million with a staff of 2,870.
- France Cables et Radio (FCR) is responsible for new ISDN [integrated services digital network]-type services: Transfix, Transcom, and Transdyn. FCR has its own subsidiaries, including those responsible for value-added messaging services and promoting French telematics products internationally. In the course of 1990, FCR acquired 32.5 percent in the capital of Nortel, operator for ENTel Argentina, and acquired 80 percent of Cylix Communications in the USA. FCR announced a 1990 turnover of FF 1,500 million and a staff of 970.
- Entreprise Generale des Telecommunications (EGT) supplies, installs, and maintains equipment such as Eurosignal, radio telephone receivers, telephone answering equipment, and facsimile terminals. In 1990, this division employed some 1,080 staff and reported a turnover of FF 1,000 million.
- Telecom Systemes Mobiles (TSM) is responsible for the cellular mobile telephone system. In the course of 1990, TSM bought a 10 percent share in the British company Phonepoint. In 1990, this division announced a turnover of FF 200 million and had a staff of 170.
- Telediffusion de France (TDF) is the television operator in which Cogecom has a 51 percent shareholding. In 1990, TDF reported a turnover of FF 3,600 million and a staff of 4,140.
- Other Cogecom subsidiaries had a staff of some 10,300 and accounted for a turnover of some FF 11,600.

By the end of 1990, France Telecom staff numbered 164,000. The organization had begun to shed staff in the late 1980s, but a renewed hiring policy at the end of 1989 meant that 4,000 employees were taken on in the course of 1990, of which 1,050 were in management positions. This brought the proportion of management level employees to 14 percent.

Research and Development

Approximately 4 percent of France Telecom's total turnover was devoted to research in the course of 1990. This includes some FF 2,000 million for research conducted by the Centre National d'Etudes des Telecommunications (CNET), and more than FF 2,000 million devoted to outside R&D contracts. CNET employs almost 4,000 people; in addition, 135 scientists from other administrations (primarily the CNRS), as well as 140 post-doctoral thesis candidates work in CNET laboratories. CNET devotes approximately 30 percent of its resources to basic research for telecommunications applications, 48 percent to network studies, and 22 percent for product lines (terminals, services, mobiles, etc.).

- TRANSPAC operates the packet switching network. In 1990, this division announced a turnover of FF 3,600 million and a staff of 1,000.

The Telephone Network

By 1991, the number of main telephone lines had increased by more than one million, bringing the total to over 28 million. The demand for new residential lines has started to diminish, whilst the business demand, driven primarily by the explosive growth of fax, has risen significantly (upwards of 650,000 lines in 1990).

The PSTN's rapid growth from a very modest base has given France a technical lead over other countries. By the end of 1990, 75 percent of all transit switches were digital, as was 93 percent of the local network. CCITT [International Telephone and Telegraph Consultative Committee] Common Channel Signalling System No. 7 was implemented on international transit switches by the end of 1989.

Automatic free calls for PSTN subscribers calling registered organizations (who pay for the calls) are provided by "Numero Vert" - Green Number - for national and international calls. At the beginning of 1991, this service had some 14,300 subscribers. Other services also showed a marked upward swing in the course of 1990, summarized below:

- Custom calling: 1,700,000 subscribers, an improvement of 41 percent over 1989;
- Itemized billing: 2,450,000 subscribers, an improvement of 36 percent over 1989;
- Direct inward dialling: over 12,000 business sites, a 50 percent increase over the 1989 figure. These installations cover more than 3 million telephone numbers;
- Card-operated public payphones: 72,000, an increase of 30 percent. 60 million telecards were sold in 1990, a remarkable increase of some 40 percent. By the beginning of 1991, telecards accounted for 67 percent of the total turnover brought in by public payphones. The newly introduced Pastel credit card was also in demand during the course of 1990 and had, by the beginning of 1991, some 810,000 subscribers.
- Dedicated lines: accounted for FF 5,700 million in gross income in 1990, an increase of 14 percent on 1989, and represented France Telecom's second most important product, after the telephone. By the beginning of 1991, there were 543,000 dedicated lines (380,000 local and 163,000 long distance).

International telephone traffic in 1990 reached 1,900 million minutes, a 13 percent increase on 1989's figure. Turnover achieved was approximately FF 9,600 million, up by 14 percent over the 1989 figure. Telephone traffic accounts for 86 percent of revenues from international operations which represent 10.8 percent of France Telecom's total turnover. The high volume of traffic is partly attributable to the fact that international calling rates from France are among the lowest in Europe.

France has a competitive market for private telecommunications equipment. Telephone handsets can be rented from France Telecom or purchased from approved suppliers. The PBX market is supplied entirely by the private sector. Alcatel and Jeumont-Schneider are the

major PBX suppliers, with Matra-Ericsson Telecommunications also having a strong presence. GPT (now owned by GEC of the UK and Siemens of West Germany) established in 1990 a subsidiary in France (GP Telecommunications) to sell customer premises equipment.

Mobile Communications

Although the development of mobile communications in France was initially rather sluggish, particularly compared with its European neighbors, the end of the 1980s saw rapid growth in one of France's more competitive markets.

France Telecom describes itself as the main operator in this field, and in the face of increasingly ferocious competition, has had to innovate in both marketing and technological divisions in order to hold its ground. The company coordinates the different services marketed by the Group's operational entities under the central division Telecom Systemes Mobiles. These services include:

- Radiocom 2000
- Alphapage
- Eurosignal
- Operator

Radiocom 2000

Radiocom 2000 is a cellular radiotelephony system operating at 200MHz and 450MHz. This service had 230,000 subscribers by the beginning of 1991, a 40 percent increase on 1989's figure. Radiocom 2000 covers all the national territory and 97 percent of France's population. The high-density network, deployed in July 1990 in the Ile-de-France region, enabled the gradual resumption of subscriptions for nationwide service. In addition, two new regional services subscriptions are now commercialized: France North-East and Ile-de-France VHF.

Radiocom 2000 provides two types of service: car telephony, enabling calls to or from the public switched telephone network (PSTN) to be initiated or received in a vehicle; and corporate network type services, among a closed group of mobile users. This latter concept is made up of mobile terminals, with or without access to PSTN, and stationary terminals known as "bases."

Alphapage

Alphapage, the radio-paging system, opened in 1987, and was brought to the market by Telecom Systemes Mobiles. The system transmits messages in alphanumeric form in the following ways: text messages of up to 80 characters from a Minitel; messages of up to 15 digits from either a Minitel or a voice-frequency telephone; four sound or light signals triggered by telephone. By 1990, the service had attracted more than 60,000 subscribers and was available in 29 cities of more than 100,000 inhabitants - effectively more than half of the French population. Stockpage, Alphapage's E-mail

system, memorizes the messages for 24 hours. These messages can be consulted on a Minitel.

Eurosignal

Eurosignal, a personal paging service, has continuous coverage of some 835,000 km through France, Switzerland, and Germany. The system operates a tone and light signal and is conceived of as a precursor to European-wide mobile services. By 1990, it had a subscriber base of some 120,000.

Operator

Operator, a radiopaging service marketed through TDF, enables the carrier to receive audible signals or numerical codes at any point where the French radio station France Inter can be received. By the beginning of 1990, the number of subscribers had more than quadrupled from 4,000 to 18,000. The turnover was approximately 70 million francs, 40 percent generated by subscriptions and 60 percent by sales of receiver terminals. Also by 1990, voice E-mail, an E-mailbox service, and 24-hour operator assistance were in operation.

France Telecom has started programs aimed at developing future services. These include the following.

- GSM, the future pan-European digital cellular mobile system, is slated to replace Radiocom 2000. Defined by a European standard, GSM will enable travelling subscribers to converse with one another and to transmit data from, for example, a Minitel. Pilot networks were ordered from two industrial groups, Matra Communications associated with MET (Matra-Ericsson Telecommunications) and the consortium ECR 900 made up of various European affiliates of Alcatel NV, AEG and Nokia.
- Pointel, a new-second generation cordless communications system, enables a caller to place calls toward the PSTN via a cordless "callbox". A pilot network is planned for 1991.
- Euteltracs, Eutelsat's messaging and vehicle location system, is operated by France Telecom. The company has announced that it will be brought into service in mid-1991. The ground system is located at France Telecom's Rambouillet Centre des Telecommunications des Reseaux Exterieurs. Two antennae relay Euteltracs signals to and from two Eutelsat satellites. The ground station is linked to the control centers belonging to each operator wishing to offer the Euteltracs service. Euteltracs allows two-way alphanumeric communication with vehicles anywhere in Europe. Fleet operators are also able to monitor the position of their vehicles via computer displays at their control center.

Data Communications

In 1984, France upgraded its original Transmic ("mic" is the French acronym for pulse code modulation) digital leased-circuit service into separate services, providing full-duplex, synchronous transmission. The low-speed

service provided transmission speeds of 2,400, 4,800, and 9,600 bps and was based on land links between access points in major towns. In 1986, Transcom, a new low-end service, opened to provide full-duplex, synchronous transmission at 64K bps. The medium- to high-speed service, called Transfix, provides transmission rates of 48 bps to 1,024K bps, though an effective transmission rate of 2,048K bps can be reached by combining two 1,024K bps circuits. The Transfix service is based on a combination of land and satellite links via the Telecom 1A and 1C satellites. France Telecom supplies the modems for this service as part of the installation and prohibits connection of privately supplied modems. The third service in the "Trans" range is Transdyn, an ISDN-type service using leased circuits. This service offers point-to-point and point-to-multipoint links with a preprogrammable configuration. It provides transmission rates between 2,400 bps and 19K bps.

Transmission over the French PSTN is available at the following speeds:

- 50 to 300 bps full-duplex, asynchronous/synchronous;
- 600 bps and 1,200 bps half-duplex, asynchronous/synchronous;
- 1,200 bps full-duplex, synchronous;
- 1,200, 2,400, and 4,800 bps half-duplex, synchronous.

The PSTN also provides for international connections at 1,200 bps full-duplex and 4,800 bps half-duplex. Users can obtain modems for all speeds from approved suppliers.

Nonswitched data-transmission services use both analog and digital leased circuits. Telegraph grade, voiceband, and wideband analog circuits are available with full-duplex transmission rates of 50 bps to 72K bps. International leased circuits, via analog links providing rates of up to 72K bps, are available to all Western European countries. Leased circuits to Canada, Japan, and the USA provide analog rates of up to 9,600 bps via cable and digital rates of up to 56K bps via satellite links.

TRANSPAC

The French Packet-Switched Data Network (PSDN), TRANSPAC, introduced at the end of 1978, is operated as a Cogecom subsidiary. The service provides X.25 and asynchronous connections via a dedicated network of switches connected by high-speed links. TRANSPAC carries 2,700,000 million characters each month, 45 percent of which are for the Teletel service. It is the world's largest packet-switching network with, at the end of 1990, more than 82,000 direct accesses and 210 switches (see Table 1).

Other services using the TRANSPAC network include telex, teletex, and videotex (Teletel). Regular subscriber switches are gradually being replaced by advanced switches with SESA DPS 25 architecture. Transit switches, based on the multipurpose Alcatel X83 design, handle trunk traffic between subscriber switches.

There are two main types of access to TRANSPAC: direct connection and the PSTN. Both methods are full duplex, though access is also available via the telex network at 50 bps through half-duplex, asynchronous links. Direct access provides rates of 300 bps and 1,200 bps asynchronous and 2,400 bps to 48K bps synchronous. Access via the PSTN provides rates of 300 bps and 1,200 bps asynchronous, 1,200 bps and 75 bps for videotex, and 2,400 bps and 4,800 bps synchronous. Users with direct connections can access each other, or PSTN or telex connections. PSTN or telex users can access only direct connections. The "Noeud de Transit International - NTI" (International Transit Node) provides connections to many overseas countries. The unit price per kilobit was reduced from 7.3 centimes to 6.9 centimes in January 1990.

Table 1: TRANSPAC Accesses

Year	Number of Direct Accesses
1986	41,000
1987	51,000
1988	60,200
1989	70,000
1990	82,000

Text Services

Telex, enhanced with the Minitel and Telex Plus services, has continued to be a popular international communications tool. Minitel (use of a Minitel to send telex messages) attracted some 6,000 subscribers in 1990, and more than 10,000 subscribers were expected by the end of 1991. Telex Plus, a facility offered to any telex subscriber, enables messages to be sent simultaneously to multiple destinations.

Teletex, an international electronic mail service, permits the exchange of office documents among dedicated terminals and specially equipped personal computers. In 1990, the number of subscribers reached 7,000, with some 25,000 users. Terminals from approved suppliers can be connected via a dedicated line to the PSTN or PSDN networks.

By the beginning of 1990, France Telecom reported that some 12,377 information services were available on the Teletex network. They are divided roughly equally between general interest and professional services. On the other hand, professional consultations continued to increase in the course of 1990: professional traffic represented 52 percent of all videotex, versus 46 percent in 1989. The most extensively known service is the Electronic Directory which in 1990 received 40 million calls and was consulted for a total of 1.4 million hours per month. As an extension to this service, France Telecom introduced the first telematic E-mail service, known as Minicom. Initial results in 1990 reveal consultation rates on the same order as those for the Electronic Directory.

At the end of 1990, the number of Minitels exceeded 5.6 million, one million of which are on lease; this is equal to one in five subscribers. In 1990, the Minitel generated direct turnover of FF 2,100 million.

Fax services have continued to expand at an almost explosive rate. The number of fax terminals at the beginning of 1991 had reached 580,000. Traffic is about 15 pages sent per day per terminal on average.

Value-added services offer a broad range of information services to any terminal connected to the server. Well positioned among the E-mail services proposed by France Telecom, Atlas 400 is the standardized public support for value-added services and electronic data interchange (EDI). The three main applications for Atlas 400 are personal messages, multiple terminal distribution, and EDI. By the beginning of 1991, there were 3,700 mailboxes, including 220 private servers.

Figure 1. CNET's Research and Development Activities

Networks and Services: 54 per cent
Basic Telecommunications: 30 per cent
Network Management: 16 per cent

Video Services

Videoconferencing services in France are offered through France Cables et Radio (FCR). By 1991, FCR was able to announce that it could provide videoconferencing services from 11 public studios in ten major cities - Bordeaux, Lille, Lyon, Marseilles, Metz, Nantes, Paris, Rennes, Rouen, and Toulouse. Ten mobile studios have also been operational since the beginning of 1985, while subscribers can build and operate their own private studios. Links are available to the USA, the UK, Germany, Italy, the Netherlands, and other countries. International videoconferencing usage underwent a sudden boom in the early part of 1991 as a result of restricted air travel in the wake of the Gulf war.

ISDN

The development of ISDN services in France has proved a considerable success.

The first ISDN project was undertaken as far back as 1986 in the Cotes du Nord and Rennes regions of Brittany. Part of this project involved developing a migration path toward a future broadband ISDN.

In 1987, France Telecom began providing Numeris, its full national ISDN service. The first interconnection trials began in 1989 and France Telecom began setting up accesses, connectors, and services in order to link up with other countries which had already developed their ISDN systems.

Primary access has been offered since October 1989, and allows the connection of 30 B channels at 64K bps and one D channel also at 64K bps. It is available along with the basic access which has been in place since 1987 (two B channels at 64K bps and one D channel at 16K bps).

Owing to its high bit rate (2M bps), primary access meets the needs of large installations such as private switches (PABX), big computers, and servers, and applications which require more than six basic accesses. France Telecom also extended its offer of Numeris terminals with a new range of telephone sets, adaptors, and switches.

By the beginning of 1990, basic and primary accesses were made available in the Paris area and the new towns of the Ile de France region, as well as in Lille, Lyons, and Marseille. By 1991, the service was available nationwide with some 500 basic accesses and 500 primary accesses.

At the same time, France Telecom has pursued a policy of forming partnerships for the development of Numeris. By 1990, 38 partnership agreements had been signed with customers, as well as nine cooperation agreements with computer manufacturers including: Bull, Electronic Data Systems, Apple, ICL, Telesystemes, Hewlett Packard, Nixdorf, and IBM.

The Future

Clearly, France Telecom's strategies, both domestic and international, have been very much defined by changes in the regulatory structure of the French telecommunications environment and the way in which powerful operators, like Alcatel and Matra, have been moving in predatory circles around France Telecom's central base.

The government formed by Edith Cresson in May 1991 is likely to introduce much more caution into industrial policy than did the government of Michel Rocard, which still only moved towards deregulatory measures under the weight of EC pressure. At the end of May 1991, Cresson announced the creation of a new "superministry" which would take responsibility for finance, industry, foreign trade, and telecommunications. France Telecom, which had been given financial autonomy only a few months earlier, has found itself once again under government control.

Nonetheless, the pace of change has been set and it seems inevitable that France's telecommunications sector, albeit grudgingly, will move towards a much freer environment. For France Telecom this has meant a huge push in internationalization, diversification, and research.

(Datapro Research Staff)

Infrastructure, Market Analyzed

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[Unattributed article: "French Market for Public Switching and PBX, KTS, and Centrex"]

[Excerpts] [passage omitted]

France: A Case Study

France recently completed a reorganization that split France Telecom (FT) from the government as a whole. FT is now a government-owned corporation, but does not rely on government funding. The lucrative French market features one of the most advanced digital networks in the world. Technological innovation has flourished with government participation, but software services and network applications have not kept pace. FT runs the risk of losing its high-margin international accounts to carriers that offer integrated network services, including leased lines and facilities management. FT's competition will come from international players such as British Telecom, Cable & Wireless, and Digital Equipment Corporation.

Within France, in the public sector, Alcatel has a lock on the market with a 1990 market share of 92 percent. Despite economic uncertainty, FT added 2 million new lines last year. France's telecommunications infrastructure is very mature with a high percentage of digitization. Advanced network services hold the greatest potential for growth. French ISDN is making significant progress. Last year, ISDN interconnection with Germany, Belgium, the USA and Japan was accomplished.

In the private switching arena, France is one of the largest and most attractive markets in Europe - and it is also one of the most difficult to penetrate given Alcatel's dominance. France is the second largest PBX/KTS [private branch exchange/key telephone system] market in Western Europe. CPE [cellular phone equipment] demand is expected to grow moderately through 1993.

Public Switching

Position

- Market size, 1990: 9,903,000 DLLPIS
- Installed base: 28,003,000 MLIS
- Percent digital installed base: 69 percent

Market leaders, 1990

- Alcatel: 92 percent market share

Local Distributors

- Alcatel: Alcatel CIT (Subsidiary)
- Telic Alcatel (Subsidiary)

Growth Potential

- 11,601,000 DLLPIS 1991-1995

Market Assessment

Despite a global recession, the Persian Gulf crisis, and the maturity of the French network, FT added 2 million new lines last year.

During the past year, France, Germany, Japan, the USA, and the UK continued to lead in the race towards national ISDN deployment. In the USA, local exchange companies and long-distance carriers tariffed several new commercial offerings. France and Germany both

continue to progress steadily in building a national ISDN network. They have also agreed to interconnect their national services to create the first integrated European service - a landmark in ISDN. Japan and Britain also completed trials, but there is still considerable resistance to widespread ISDN deployment. [passage omitted]

In France, its ISDN offering, Numeris, continues to grow and it is expected to have more than 150,000 subscribers by 1992. E-10-based basic rate ISDN service was offered in Paris, Marseilles, Lyons, and Lille in 1989. Primary rate service went into commercial operation late in the year. In 1990, ISDN coverage expanded throughout the country with special emphasis on graphics and video applications. In the same period, FT achieved ISDN interconnection with Germany, Belgium, the USA, and Japan.

Domestically, the expansion of ISDN across France will result in steady demand for Alcatel E10 systems, which have been modified specifically for the network. Two years ago, FT introduced Ericsson's AXE systems into the network as a means of maintaining competition between two CO [communications operations] suppliers. In 1990, 16 percent of lines placed in service belonged to Ericsson.

New ISDN software releases expected to appear in France this year will support image applications and interconnection of PBXs [private branch exchange] with PRI.

Regulatory Issues/Policy Issues

The French parliament recently approved plans to deregulate certain telecommunications services, most notably CPE and value-added network services. The final outcome of these moves is still pending.

FT, meanwhile, is one of a handful of former PTTs moving beyond national borders. Despite its continued links to the French government, FT recently created a unit charged with seeking out overseas ventures. One targeted project would be a cellular network in Greece.

In the transmission market, France wants to lead Europe in the development of advanced telecommunications systems and services. Though loyal to domestic suppliers, FT seeks the most advanced technology available in order to maintain its leading position. For instance, FT is acquiring digital cross-connect systems from AT&T. Opportunities exist for suppliers touting advanced technologies that fit into France's domestic network and that FT can exploit in international markets. Nationalist concerns remain a top priority however.

Public Switching Outlook

France's telecommunications infrastructure is extremely mature with its current 69 percent digital installed base. Advanced network services including the "Colisee" VPN network, hold the greatest promise for potential growth. Despite a still sluggish economy, FT is counting

on the advanced state of its system as a competitive strength. Furthermore, with E10 and AXE systems set side by side within the Numeris network, more advanced service offerings will be another strength. For CO suppliers, however, the Alcatel-Ericsson hold on the market makes France a closed field.

The French PBX, KTS, and Centrex Market

Position

- Access lines, 1989: 26,305,000
- KTS shipments: 285,000
- PBX shipments: 1,177,000
- Centrex lines placed in service: 0
- Total: 1,462,000

Market Assessment

- The Finance Ministry of France has simplified procedures for foreign investment by lifting the country's remaining exchange controls. In addition, the French PTT has been subject to deregulatory measures.
- France is the second largest PBX/KTS market in Western Europe, accounting for about 20 percent of all lines sold.
- CPE demand is expected to grow moderately through 1993.
- Voice messaging products are in high demand, and vendors may enter the systems market by first providing related market products.
- Over the next few years, the CPE industry will continue to restructure, with small players dropping out and larger established players or large newcomers picking up the pieces.
- FT's aggressive promotion of ISDN will spur demand for ISDN PBX equipment. By 1993, France will purchase approximately 20 percent of all ISDN PBXs in Europe.
- Centrex service is available on a limited basis from FT and will most likely be incorporated into ISDN service offerings.

Regulatory Outlook/Policy Issues

- An EC member and policy leader, France is also the greatest champion of "sovereign rights" to protect domestic industry.
- France faces both local and international pressure to continue to liberalize its telecommunications policies.
- France's trade unions remain extremely resistant to innovation, deregulation, liberalization, and reform.

Distribution Opportunities

- A large, well-developed, and powerful network of independent and semi-independent distributors is the main sales channel in France.
- However, suppliers are developing direct sales in lieu of independent distributors in an attempt to decelerate price erosion in the French PBX market.
- FT's desire to increase share in the KTS market and break into the PBX market represents a new opportunity, particularly for suppliers with ISDN.

Outlook

Although the oil crisis has affected France's economic growth, its inflation rate still regularly dips well below the EC average. With its robust economy, France is one of the largest and most attractive markets in Europe, and one of the most difficult to penetrate. The reason: Alcatel—a global force in telecommunications.

Alcatel N.V. is emerging as a top global force in telecommunications for the 1990s. The company has the financial ability, the management experience, and the desire to continue to expand in telecommunications. By the middle of the decade, Alcatel, which bows to no one on its home turf, France, could become the world market leader in most public, and some private, network equipment sectors.

Since its foundation in 1987, by a merger of ITT's telecommunications companies and Alcatel's French-based telecommunications operations, Alcatel N.V., against all odds, has been an unqualified success.

The ITT European telecommunications empire that Alcatel bought was crumbling. Its flagship product, System 12 (S12), did not work properly and, bloated with excess workers, products, and manufacturing capacity, ITT was barely turning a profit. With break-neck speed, Alcatel turned the company around, successfully integrating the ITT companies with its French operations, trimming staff, rationalizing manufacturing and R&D, and fixing the flaws in S12.

Public network equipment sales increased faster than private network sales, and European sales mounted faster than international sales. Without a doubt, this was due to the success of S12 in Europe. It is now the most widely used digital switch in Europe. Europe's largest and most important PTT customers are satisfied with the switch's performance.

The success of S12 demonstrated the technical and marketing skills of Alcatel's managers. Not only were S12's problems fixed, but customers were convinced of its future viability and Alcatel's ability to manage two product lines in CO switching, S12 and the French E10. FT, the French PTT, is counting on E10 to build one of the most sophisticated public "intelligent networks" in the world. Technical co-evolution for intelligent networks, shared components, software, submodules, and supermodules will keep both switches competitive throughout their product lives.

With its acquisition of Telettra, Fiat's telecommunications transmission equipment subsidiary, Alcatel now rivals AT&T in size. The current Alcatel game plan is to continue to build its European public and private network equipment business, and to expand operations in the Pacific region - NTT, the Japanese PTT and the richest telecommunications company in the world, is notably absent from Alcatel's major client list - without neglecting Eastern Europe, Latin America, the Middle

East, and Africa. By the mid-1990s, Alcatel is likely to enter the US market on a large scale, both in public and private networks.

Because of its financial resources, and above all because of its proven ability to grow organically and through acquisition, Alcatel is among the most dangerous competitors in telecommunications today.

In 1990, Alcatel had 14.9 percent of the digital local lines placed in service (DLLPIS) worldwide, second only to Northern Telecom. Alcatel also led the world public switching vendors in Eastern Europe last year with a total market share of 74 percent of the digital local lines shipped to the region.

Alcatel benefits from the strategic location of its many subsidiaries. The governments of Italy, Spain, and Belgium have traditionally provided Alcatel customers with favorable financing. Alcatel Bell Telephone, the company's Belgian manufacturing division, arranged joint ventures for S12 switch production in China and Turkey with the help of Belgian government foreign aid. As a result, Alcatel has placed more than 1 million digital lines in service in each of these countries. Through Alcatel SEL, the company's German subsidiary, Alcatel became the first supplier to install a digital switch in the former German Democratic Republic. In addition, French government-financed joint ventures in Poland and the USSR were instrumental in making Alcatel the top supplier of digital switches in Eastern Europe.

Alcatel is positioned to become the number-one switch supplier within the next two years. The company is rapidly expanding its presence through joint ventures in Eastern Europe. If both China and the Soviet Union develop into major markets over the next four years, Alcatel could become the runaway leader in CO.

Alcatel positions itself to capture developing market customers by finding the best financing available. With its wide geographic spread of subsidiaries, Alcatel has more ways to tap into government funds to finance its customers. Through aggressive bidding, the company was able to steal business away from other suppliers in 1990, most notably from Ericsson in Australia and from AT&T in Taiwan.

Sales resulting from low-price leadership and explorations in cash-starved developing markets will not contribute much to Alcatel's profitability, at least over the short term. However, Alcatel sees huge potential for cost savings from integrating its two CO lines, the E10 and S12. While the company once considered the two lines as separate and competing with each other, it now markets both through the same export subsidiary. Although the architectures of the S12 and E10 are radically different, Alcatel is developing common basic components to be used in both lines.

In the private sector, Alcatel is streamlining its CPE product line to eliminate overlapping product development and to provide easy migration and network development. It is attempting to cement a global market leadership position in inter-PBX signaling by announcing the Cornet system with Siemens and throwing into question the continued viability of the alternative DPNSS system.

Alcatel remains the second largest CPE supplier in the world, largely due to its dominance of the Western European PBX and KTS markets. In order to obtain the number one spot, Alcatel must either: (a) generate more sales worldwide than AT&T can draw in the USA, or (b) completely dominate an Eastern European market growing at a phenomenal rate. Although Alcatel is the unquestioned leader in Europe, it continues to face several challenges. These include rationalization of its many product lines, control of its decentralized organization, and improvement in operating efficiency. Alcatel must design an integrated product line.

(Northern Business Information Staff)

GERMANY

Germany Plans Intelligent Network Trial

91WS0467X Bath ISDN NEWSLETTER in English
17 Jun 91 p 1

[Unattributed article: "Three in Telekom Intelligent Network Trial"]

[Text] Germany's national carrier, Telekom, has awarded Northern Telecom, Siemens and German Alcatel subsidiary, SEL, contracts for a 75 million German marks [DM] intelligent network trial. Each company is in partnership with a leading computer equipment maker and the trial is scheduled to begin in Spring 1993 in eight major German cities.

Northern Telecom is to supply a DMS-100 SuperNode switch for two German cities, Dusseldorf and Frankfurt on the Main. Its partner will be CBIS (Cincinnati Bell Information Systems). Siemens Public Switching and its partner, Siemens-Nixdorf Informationssysteme are to supply trial intelligence in Hamburg, Berlin and Hanover. SEL and Digital Equipment are to supply equipment and software for the trial in Stuttgart, SEL's home city, Munich and Nuremberg.

The IN will offer Telekom customers flexible new telecommunications services that can be tailored to meet their particular requirements. Telekom plans to deliver freephone/tollfree calling, televoting and opinion polling, voice messaging and single number facilities for distributed sites.

NORWAY

Cellular Phone Sales More Than Doubled

91WT0175A Oslo AFTENPOSTEN in Norwegian
25 Jul 91 p 17

[Article by Ulf Peter Hellstrom: "Small Telephones Are Hot Item"]

[Text] Sales of small cellular telephones, which are not much bigger than your hand, have more than doubled so far this year.

The number of subscriptions to cellular telephones will approach a quarter of a million this year, according to data from the National Telecommunications Administration. Norway is still among the world leaders in distribution of this telephone service, even though sales have stagnated the last two years. The industry now awaits introduction of the new digital GSM service.

Cellular telephone service underwent vigorous growth in the second half of the 1980's when the Nordic Cellular Telephone Service was introduced. For several years Norway was number one in the world in number of cellular telephones per inhabitant, but recently we have been overtaken by Sweden.

After turnabouts in the Norwegian economy and lower consumption by firms and individuals during the last four years, the anticipated rise in sales failed to occur.

"Last year was economically rough for most suppliers, but the outlook is a little better this year. We estimate 37,000 cellular telephones will be sold, and this is an increase of 1,500 units over last year," says Svein Eliassen, director of the Alliance of Suppliers of Cellular Telephones and Radio Communications.

The small, portable cellular telephones, which use radio signals in the 900 megahertz region, have undergone explosive growth so far this year. During the first six months, sales of this apparatus have increased by 115 percent over the same period last year.

At the same time, sales of the traditional cellular telephone—the one usually installed in cars—have fallen 2 percent so far this year, according to Eliassen.

"We figure that within a short time the small, hand-sized telephones will account for more than half the market," says Eliassen.

The price of a small cellular telephone—also called a pocket telephone—is 10,000-16,000 kroner, according to people in the field. The larger cellular telephones can be obtained for prices well under 10,000 kroner.

The cellular telephone service has been very profitable for the National Telecommunications Administration. However, the government is under pressure from suppliers to reduce its prices. Within a few weeks, the Ministry of Transport and Communications will grant a

license to a private applicant who will construct a GSM network in competition with the National Telecommunications Administration. There has been a fierce tug-of-war behind the scenes over who will be allowed to compete with the National Telecommunications Administration. The private company may create a few hundred new jobs outside Oslo.

[Box, p 17]

Cellular Telephones

Nearly 18,900 cellular telephones were sold during the first six months of the year, indicate statistics from the Alliance of Suppliers of Cellular Telephones and Radio Communications: basically no change from last year. The small, portable telephones account for almost half the sales.

The market leaders are Ericsson (Sweden), Motorola (United States), Nokia/Mobira (Finland), and Philips (the Netherlands). The National Telecommunications Administration's TBK is one of this country's major channels of sales of cellular telephones from Motorola, Ericsson, and Mobira.

Other suppliers include Germany's Bosch, Dancall, Panasonic, Esselte, and Simonsen Elektro.

TURKEY

New TV Relay Stations Become Operational

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[Editorial Report] Ankara Türkiye Radyolari Network in Turkish at 2000 GMT on 15 September reports that a TV-2 relay station has been inaugurated in Pazaryolu, Erzurum; a TV-1 relay station in Yazipinar, Burdur; and TV-1, TV-2, and TV-3 relay stations in Kemalli, Giresun, and in Ruzgarli, Rize. The Pazaryolu station will relay TV-2 on channel 21 UHF; the Yazipinar station will relay TV-1 on channel 7 UHF and VHF; the Kemalli station will relay TV-1 on channel 6 VHF, TV-2 on channel 21 UHF, and TV-3 on channel 24 UHF; the Ruzgarli station will relay TV-1 on channel 11 VHF, TV-2 on channel 43 UHF; and TV-3 on channel 46 UHF.

Ankara Türkiye Radyolari Network in Turkish at 2000 GMT on 16 September reports that TV-1 and TV-2 relay stations have become operational in Inayet, Bursa, and in Tepecik, Rize. Also in Rize TV-3 relay stations have been set up in Yavuziye and Pazar, and TV-2 and TV-3 relay stations in (?Guneysu).

Ankara Türkiye Radyolari Network in Turkish at 0430 GMT on 18 September reports that TV-2 and TV-3 transmitters have been inaugurated in Nigde's Buyukkoy and Madenli, Ankara's Nallar and Bursa's Kelef districts. A TV-3 transmitter has also been commissioned in Mugla's Sevilie district.

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